

Los Alamos
Management
National Laboratory

TA-53 Facility

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TA-53 Standard

Prompt Radiation Protection

53FMS-107-01.0

Effective date: 1/1/96

APPROVALS

Prepared by: _____ (SIGNATURE ON FILE) _____ Date: 6/23/95
Olin vanDyck
Chair, Radiation Safety Committee

Approved by: _____ (SIGNATURE ON FILE) _____ Date: 6/26/95
Stan Schriber
TA-53 Landlord

1.0 Introduction

DOE 5480.25, "Safety of Accelerator Facilities," defines "accelerator" as "a device employing electrostatic or electromagnetic fields to impart kinetic energy to molecular, atomic, or sub-atomic particles and, for purposes of this Order, capable of creating a radiological area." This Standard fulfills the requirement that DOE contractors establish a written shielding policy for accelerator facilities.

2.0 Purpose

This document establishes performance standards for protection of personnel from prompt radiation produced by accelerator operation at TA-53, and supports compliance with DOE Order 5480.25, *Safety of Accelerator Facilities*; the *LANL Radiological Control Manual* (LM107-01); Laboratory Standard LS107-01, *Accelerator Access Control Systems*; LS107-02, *Radiological Posting*; and 10 CFR 835, *Occupational Radiation Protection*.

3.0 Scope

The charter for the TA-53 Radiation Safety Committee defines the scope of activities carried out to ensure compliance with this Standard. The effective date of this Standard reflects its application to LANSCE operations in FY 96 and beyond.

4.0 Definitions and key concepts

Prompt radiation is the component of the accelerator facility radiation field that is caused by the particle beam and disappears essentially immediately when beam is turned off, as distinguished from radiation produced by material activation.

Normal operation means accelerator operation and beam delivery within the established operating envelope of the facility, with scheduled beam parameters for scheduled purposes, with the standard interlock and safety systems operational for equipment and personnel protection, and with shielding and access barriers in place. "Established" or "standard" parameters and conditions are documented in the facility Operating Manuals and the Safety Assessment Document(s).

Access control barriers are physical barriers to prevent unauthorized personnel access. Barriers must be adequate to prevent unintentional or accidental access or access without willful intent to defeat the protection system. Access control barriers can include walls, shielding, or fences with appropriate posting; and locked or interlocked doors and gates.

The design basis accident is an extreme condition assumed for purposes of defining minimum shielding and access barrier requirements. By default, it is assumed to start with delivery for up to one hour of the highest beam power that can reach an area with any combination of credible failures of the beam distribution system, and beam impingement where it would produce the highest radiation at any place accessible to a person outside secured areas. The radiation safety analysis of each primary beam area should consider factors limiting beam power, accident duration, and radiation, and develop the design basis accident scenario in detail.

5.0 Responsibilities

This Standard shall be applied by the TA-53 Radiation Safety Committee in accordance with the charter of that Committee. Line management is responsible for implementing the requirements of this Standard.

6.0 Precautions and Limitations

TA-53 FACILITY MANAGEMENT STANDARD	PROMPT RADIATION PROTECTION	53 FMS 107-01.0 Effective 1/1/96 Page 4 of 5
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Not applicable.

7.0 Standard Requirements

7.1. Protection During Normal Operation. The shielding and access control perimeter shall be configured to support ALARA objectives. Access controls and area postings shall be made to comply with LANL standards. Detailed interpretation of the access control requirements and oversight of implementation shall be made the responsibility of a special committee.

7.2. Protection from the Design Basis Accident. The shielding shall be configured so that no offsite exposure to a person can exceed 1 rem. Onsite areas which have a potential radiation dose rate exceeding 25 rem per hour in the design basis accident shall have special access controls based upon evaluation and acceptance of the risk by the operating organizations.

7.3. Review of Standard. Periodic review of this Standard to ensure consistency with Laboratory and DOE requirements should be carried out at the direction of the TA-53 Site Landlord.

7.4. Acceptance. This Standard will be included in the Safety Assessment Document for the LANSCE/LAMPF accelerator complex at TA-53. The Standard will be effective as of the date shown on the Standard subject to acceptance by the Site Landlord, and will supersede the *Recommended Operating Policies and Accepted Practice for Prompt Radiation Protection at LAMPF* and *Recommended Guidelines for Shielding and Radiation Safety System Design at LAMPF*, approved by Fred Morse, Associate Director for Research, on 6/24/91.

8.0 Required Records

The Chair of the TA-53 Radiation Safety Committee shall maintain records of reviews conducted to verify compliance with this Standard.

9.0 References

- TA-53 Radiation Safety Committee Charter
- 10 CFR 835, *Occupational Radiation Protection*
- DOE 5480.25, *Safety of Accelerator Facilities*
- LM 107-01, *LANL Radiological Control Manual*
- LS 107-01, *Accelerator Access Control Systems*
- LS 107-02, *Radiological Posting*